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| **CHEM 101 SYLLABUS** | | |
| **Text book: Raymond Chang, Chemistry, 10th edition, 2010** | | |
| **Topics** | **Text book pages** | Number of Lecture |
| ***Chapter 1: Chemistry: The Study of Change*** | | |
| **1.4** Classifications of Matter: substances and mixtures, elements and compounds  **1.5** The Three States of Matter  **1.6** Physical and Chemical properties of Matter: intensive and extensive properties  **1.7** Measurement: SI units, mass and weight, volume, density, temperature scales  **1.8** Handling Numbers: scientific notation, significant figures, accuracy and precision  **1.9** Dimensional Analysis in Solving Problems: conversion factors, a note on problem solving | **10 - 30** | **9** |
| ***Review and Exercises*** | |
| ***Chapter 2: Atoms, Molecules and Ions*** | | |
| **2.2** The Structure of the Atoms: the electron, radioactivity, the proton and the nucleus, the neutron  **2.3** Atomic Number, Mass Number and Isotopes  **2.4** The Periodic Table  **2.5** Molecules and Ions: molecules, ions  **2.6** Chemical Formulas: molecular formulas, empirical formulas, formula of ionic compound  **2.7** Naming Compounds: ionic compound, molecular compound, acids and bases, familiar inorganic compound | **43 - 68** | **7** |
| ***Review and Exercises*** | |
| **FIRST MIDTERM EXAM** | | |
| ***Chapter 3: Mass Relationships in Chemical Reactions*** | | |
| **3.1** Atomic Mass: average atomic mass  **3.2** Avogadro's Number and the Molar Mass of an Element  **3.3** Molecular Mass | **80 - 87** | **8** |
| **3.5** Percent Composition of Compounds  **3.6** Experimental Determination of Empirical Formulas: determination of molecular formulas  **3.7** Chemical Reactions and Chemical Equations: writing chemical equations, balancing chemical equations  **3.8** Amounts of reactants and products  **3.9** Limiting Reagents  **3.10** Reaction Yield | **88 - 107** |
| ***Review and Exercises*** | |
| ***Chapter 4: Reactions in Aqueous Solutions*** | | |
| **4.4 Only**combinationreactions, decomposition reactions, combustion reactions | **139 - 141** | **1** |
| **4.5** Concentration of solution | **147 - 149** |
| ***Review and Exercises*** | |
| ***Chapter 5: Gases*** | | |
| **5.1** Substances That Exist as Gases  **5.2** Pressure of a Gas: SI units of pressure, atmospheric pressure,  **5.3** The Gas Laws: the pressure-volume relationship: Boyle's Law, the temperature-volume relationship: Charles's and Gay-Lussac's law, the volume-amount relationship: Avogadro's Law  **5.4** The Ideal Gas Equation: density calculation, the molar mass of a gaseous substance  **5.5** Gas Stoichiometry  **5.6** Dalton's law of Partial Pressures | **174 - 201** | **5** |
| ***Review and Exercises*** | |
| **SECOND MIDTERM EXAM** | | |
| ***Chapter 6: Thermochemistry*** | | |
| **6.1** The Nature of Energy and Types of Energy  **6.2** Energy Changes in Chemical Reactions  **6.3** Introduction to Thermodynamics: the first law of thermodynamics, work and heat  **6.4** Enthalpy of Chemical Reactions: enthalpy, enthalpy of reactions, thermochemical equations, a comparison of ∆H and ∆E  **6.5** Calorimetry: **Only** specific heat and heat capacity | **230 - 246** | **5** |
| **6.6** Standard Enthalpy of Formation and Reaction: the direct method, the indirect method (Hess's law) | **252 - 258** |
| ***Review and Exercises*** | |
| ***Chapter 12: Physical Properties of Solutions*** | | |
| **12.1** Types of Solutions  **12.2** A Molecular View of the Solution Process  **12.3** Concentration Units: types of concentration units, comparison of concentration units  **12.4** The Effect of Temperature od Solubility: solid solubility and temperature, gas solubility and temperature  **12.5** The Effect of Pressure on the Solubility of Gases  **12.6** Colligative Properties of Nonelectrolyte Solutions: vapor-pressure lowering (Raoult's Law), boiling-point elevation, freezing-point depression, osmotic pressure, using colligative properties to determine molar mass | **514 - 539** | **7** |
| ***Review and Exercises*** | |
| **TOTAL HOURS** | | **42** |

**Distribution of the 100 grades over semester:**

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|  | **Grades** | |
| **Practical** | | **30** |
| **1st midterm** | **15** | **30** |
| **2nd midterm** | **15** |
| **Final exam** | | **40** |
| **Total** | | **100** |

**FINAL EXAM WILL BE IN ALL TOPICS**

**الإختبار النهائي سيكون في جميع مواضيع المقرر**